## ABSTRACT

The present invention provides a manganese bismuth mixed metal oxide cathode material through a solid-state reaction between manganese dioxide, and either bismuth or a bismuth compound in a compound having the general formula $MnO_y (Bi_2O_3)_x$, which affords charge transfer catalytic behavior that allows the cathode to be fully reversible at suppressed charge potentials and increased discharge potentials. The $MnO_y (Bi_2O_3)_x$ cathode material may be incorporated into an electrochemical cell with either a lithium metal or lithium ion anode and an organic electrolyte. The present invention provides a compound with the general formula $MnO_y (Bi_2O_3)_x$, where subscript x is between 0.05 and 0.25, subscript y is about 2 and the overcharge protection is not needed as the subscript z approaches 0.0. In the preferred embodiment, a cathode material where subscript x is between 0.05 and 0.135 with the formula $MnO_2 (Bi_2O_3)_{0.12}$ provides the much-needed full reversibility, high voltage stability and reduced charge transfer impedance. A manganese bismuth mixed metal oxide cathode for an lithium electrochemical system, a lithium electrochemical system and a rechargeable lithium battery employing the same compound with the general formula $MnO_y (Bi_2O_3)_x$ and methods for making manganese bismuth mixed metal oxide cathode material for lithium electrochemical devices having the general formula $MnO_y (Bi_2O_3)_x$ are also provided.